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(54) Title of the Device: Magnetic Disk Drive Device

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SPECIFICATION

1. Title of the Device: Magnetic Disk Drive Device

2. Claims

(1) A magnetic disk drive device, comprising:

a magnetic disk, around the outer periphery of which are formed equiangularly spaced transparent or reflective slits;

a turntable on which said magnetic disk is mounted and rotated;

an optical apparatus for detecting the passage of the slits during rotation of the magnetic disk; and

a disk motor for driving the turntable such that the detection output of said apparatus will be at a constant period.

3. Detailed Description of the Device

The present device relates to a magnetic disk drive device for rotating a magnetic disk at a constant speed.

There have been numerous proposals in the past for still picture recording and reproducing devices with which a magnetic disk is rotated at a field period or a 2-field period and concentric, circular recording tracks are formed. With these still picture recording and reproducing devices, usually a magnetic disk is mounted on a turntable, the turntable is driven by a disk motor, and the rotation of the disk motor is detected by the turntable or by the disk motor itself. Thus, the rotational control of the disk motor is rotational control of the turntable or the disk motor, rather than rotational control of the magnetic disk. Therefore, a drawback is that if there is any slip between the turntable and the magnetic disk, an image signal will be recorded on a magnetic disk that is not rotating at the correct speed, and proper reproduction will be impossible.

The present device was conceived in light of the above situation, and provides a magnetic disk drive device with which slits are formed around the outer periphery of a

magnetic disk, these slits are detected, and the rotation of the magnetic disk itself is controlled.

The present device will now be described through reference to a working example illustrated in the drawings. First, FIG. 1 shows the magnetic disk of this working example. This magnetic disk D comprises a magnetic layer formed over a transparent synthetic resin substrate, and no magnetic layer is formed in the 24 transparent slits S formed equiangularly spaced around the outer periphery.

Although not absolutely necessary with the present device, these slits may be purposely given a mirror finish, since they need to be optically detected. Possible ways to accomplish this are to give the rear face of the magnetic disk D a mirror finish, or to make the entire surface of the magnetic disk D a magnetic layer and then form mirror-finish slits over the magnetic layer.

Further, the number of slits can be increased in the present device as long as they can still be detected, and there is no particular significance to using 24 slits as in this working example.

FIG. 2 is a partial cross section of a still picture recording and reproducing device in this working example.

As is clear from this drawing, in this working example a first photocoupler 1 used for detecting rotation is provided over the slits S in the magnetic disk D mounted on a turntable 2. Therefore, when a disk motor 3 begins to rotate, the rotation detection output of the magnetic disk D itself is obtained from the first photocoupler 1, which alternately receives strong reflected light obtained from the slits S, and weak reflected light obtained from the magnetic layer. The disk motor 3 is configured so that its rotation is controlled on the basis of this rotation detection output, and its phase is controlled on the basis of a comparison of the rotation detection output and a reference signal. When the rotation detection output reaches a specific frequency, a head access stand 5 that supports a magnetic head 4 reaches the recording commencement [position] depicted in FIG. 2 from its retracted position. This head access stand 5 is disposed slidably with respect to two guide shafts 6 (only one is shown in the drawing) disposed in parallel in the radial direction of the turntable 2, and a pinion 7a of a head access motor 7 is meshed with a rack 5a formed at the lower end of the head access stand 5. The position of this head

access stand 6[1] shown in FIG. 2 is the recording commencement position, and the magnetic head 4 is positioned at the outermost edge of the recording area on the magnetic disk D. A second photocoupler 8 is fixed to the head access stand 5 to detect this recording commencement position. This second photocoupler 8 comprises a light emitting element 8a and a light receiving element 8b, just as does the first photocoupler 1, and temporarily stops the head access motor 7 upon receiving the strong reflected light obtained when the outer periphery of a mating protrusion 2a of the turntable 2 that mates with a mating hole Da in the magnetic disk D is irradiated. The second photocoupler 8 is in an operating state until the magnetic head 4 moves from its retracted position to the recording commencement position. Recording and reproduction begin from this state, but the magnetic disk D that is rotating at a field period may undergo a sudden change in its slip state, which disturbs the rotation state, and in this working example, if abnormal rotation is detected, the recording operation is prohibited, which ensures the faithfulness of the recording operation. With this working example, a still picture is recorded in field units, and the head access motor 7 rotates a specific amount for each recording, so that numerous circular recording tracks are formed toward the inner periphery of the magnetic disk D.

Thus, with the present device, accurate recording is possible even if slippage should occur between a magnetic disk and a turntable, which means that the present device has a significant effect.

4. Brief Description of the Figures

FIG. 1 is a plan view of the magnetic disk pertaining to a working example of the present invention; and

FIG. 2 is a partially cut-away front view a working example of the present device.

Key to main drawing elements:

D magnetic disk

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[1] Translator's note: Apparent typo for 5.

S (transparent) slit

1 (first) photocoupler

2 turntable

3 disk motor

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Fig. 1

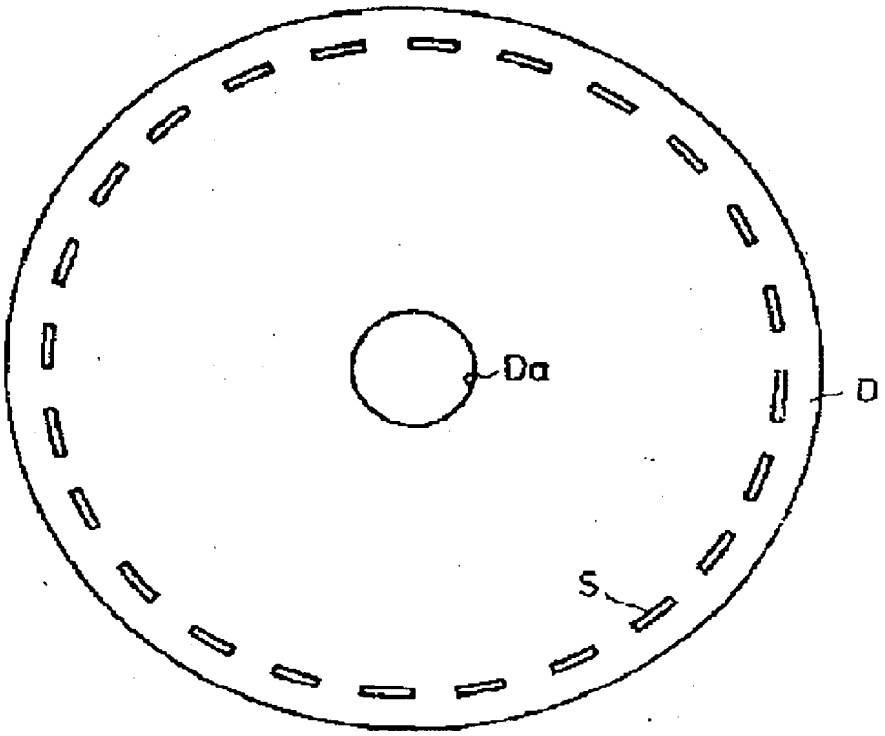

Fig. 2